

TORREYA

January, 1908

Vol. 8.

No. 1.

THE PINE-BARRENS OF BABYLON AND ISLIP, LONG ISLAND

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To the botanist who regards a habitat merely as a place where certain species of plants may be found, the pine-barrens to be described below possess few attractions, for their flora is not very rich, and nearly all the species are pretty widely distributed and well known. But to the phytogeographer every habitat that has not been too much disfigured by civilization is of interest, whether its plants are few or many, common or rare; so no apology is necessary for publishing the following notes.

The pine-barrens of Long Island are very easy of access, but they seem never to have been adequately described, chiefly for the reason given above. Brief references to them occur in some old historical works, such as B. F. Thompson's History of Long Island (1839), on page 16 of which is the following statement: "There is another extensive tract lying eastward from the Hempstead plains, and reaching to the head of Peconic Bay, composed so entirely of sand as to seem in a great measure incapable of profitable cultivation by any process at present known."

The first distinct published list of Long Island pine-barren plants seems to be that of Dr. N. L. Britton (Bull. Torrey Club 7: 82. 1880), who selected from Miller & Young's flora of Suffolk County, N. Y. (published in 1874) 46 species which he had found in New Jersey and on Staten Island to be confined to the coastal plain, or nearly so. Essentially the same list was copied by Dr. Arthur Hollick in 1893 (Trans. N. Y. Acad. Sci.

[No. 12, Vol. 7, of TORREYA, comprising pages 225-258, was issued January 16, 1908.]

12: 192), by Dr. S. E. Jelliffe in 1899 (Fl. L. I., xi-xii), and by Dr. J. W. Harshberger in 1904 (Proc. Acad. Nat. Sci. Phila. 56: 605).

The pine-barrens of Long Island are almost confined to the southern half of Suffolk County, but extend a few miles westward into Nassau, mostly in the shape of isolated patches. Dr. W. C. Braislin (Abstr. Proc. Linn. Soc. N. Y. 17-19 (1904-1907): 94. O 1907) places "the western limit of the scrub pines" at Central Park, about three miles west of the county line, where there are perhaps three or four hundred acres of pine-barrens; but I have seen other unmistakable patches of the same vegetation two or three miles farther west, namely, between Hicksville and Westbury and also about half way between Merrick and Hicksville.

The pine-barren area corresponds approximately with that of the soil mapped as "Norfolk coarse sandy loam" in the soil survey report on western Long Island by J. A. Bonsteel and others (Field Operations of the U. S. Bureau of Soils for 1903). Like most other unglaciated portions of Long Island, it is almost perfectly flat, with a barely perceptible southward slope of about 15 feet to the mile. A few very shallow valleys containing brooks or creeks traverse it, generally from north to south. It lies entirely south of the newer or Harbor Hill moraine, but partly north of the older or Ronkonkoma moraine. The soil seems to be of the Columbia formation, one of the youngest of coastal plain deposits. Its chief constituents here are silt and coarse sand. Just why pines should predominate on the "Norfolk coarse sandy loam" and deciduous trees on some equally sandy soils similarly situated a little farther west is not clear. It cannot be altogether a matter of water-content, for the pines occur also well within the edges of the swamps.

In Babylon and Islip, the two westernmost townships on the south side of Suffolk County, pine-barrens are the prevailing type of vegetation, and as there are a good many square miles of them in these townships entirely uninhabited, they are in excellent condition for study. My observations on the flora of Babylon and Islip have been confined to three trips on foot

across the pine-barrens from north to south in the fall of 1907. On October 6 I traversed the pine-barrens of Islip in going from Smithtown to Babylon by way of Brentwood and Edgewood; five days later I went from Hicksville to Babylon (station) by way of Pinelawn, and on November 3 from Cold Spring station to Amityville, the latter half of this journey being also through the township of Babylon.

There seem to be only two natural types of vegetation in the region under consideration, namely, dry pine-barrens and swamps. The swamps are confined to narrow belts along the streams, and the only one I have examined is that of Santapogue Creek, two



FIGURE 1. Dry pine barrens about one-half mile south of Edgewood station (town of Islip), Oct. 6, 1907. Trees all *Pinus rigida*, the largest about 9 inches in diameter and 30 feet tall. Undergrowth almost entirely *Quercus ilicifolia* and *Q. prinoides* in equal proportions, about 4 feet tall. The picture embraces a horizontal angle of about 36° . This scene is typical of thousands of acres in both townships.

or three miles west of Babylon station. The dry pine-barrens are fairly uniform over many square miles, the principal natural variation being that toward the northern edge the shrubs are

smaller and the herbs more numerous than elsewhere. Southward the arborescent species of oaks become larger and more numerous and gradually crowd out the pines. The northern boundary of the pine-barrens seems to be more sharply defined.

The average appearance of the dry pine-barrens is illustrated better by the accompanying photographs* than it could be by any description. The pines are the dominant feature of the landscape, and the underbrush consists chiefly of a dense growth of two shrubby oaks,† all the individuals of both reaching approximately a uniform height in any one locality. The herbs are more numerous in species, but more scattered and inconspicuous. The dry pine-barrens have probably always been subject to occasional fires, which since the advent of civilized man have become frequent enough to kill a good many of the pines but otherwise have perhaps caused little change.

The species observed in this habitat in the two towns mentioned are as follows. They are divided first into trees, shrubs, and herbs, and then arranged approximately in order of abundance in each class.

TREES	HERBS
<i>Pinus rigida</i>	<i>Pteridium aquilinum</i>
<i>Quercus alba</i>	<i>Ionactis linariifolius</i>
<i>Quercus coccinea</i>	<i>Cracca virginiana</i>
<i>Quercus stellata</i> (<i>Q. minor</i>)	<i>Baptisia tinctoria</i>
<i>Populus grandidentata</i>	<i>Dasystema pedicularia</i>
	<i>Solidago bicolor</i>
SHRUBS	
<i>Quercus ilicifolia</i> (<i>Q. nana</i>)	<i>Andropogon scoparius</i>
<i>Quercus prinoides</i>	<i>Solidago odora</i>
<i>Comptonia peregrina</i>	<i>Lespedeza hirta</i>
<i>Pieris Mariana</i>	<i>Sericocarpus linifolius</i>
<i>Gaylussacia resinosa</i>	<i>Helianthemum</i> sp.
(and others?)	<i>Sericocarpus asteroides</i>

* None of the existing local floras of Long Island is illustrated, so far as known to the writer, so these may be the first photographs of Long Island pine-barren vegetation ever published.

† These two oaks are remarkably similar in appearance, considering that they belong to different sections of the genus. See in this connection Rehder, *Rhodora* 9 : 61. 1907.

<i>Vaccinium</i> spp.	<i>Chrysopsis Mariana</i>
<i>Smilax glauca</i>	<i>Aster concolor</i>
<i>Rhus copallina</i>	<i>Epilobium angustifolium</i>
<i>Arctostaphylos Uva-ursi</i>	<i>Gaultheria procumbens.</i>

Besides these, *Aster spectabilis*, *Laciniaria scariosa*, *Lespedeza capitata*, and *Sarothra gentianoides* were seen along some of the roads, and they may perhaps also occur naturally in the pine-barrens. *Chrysopsis falcata*, which is commonly regarded as a typical northern pine-barren plant, I have found only on a gravelly hill in Smithtown,* and (abundantly) in gravel between the rails



FIGURE 2. Two scenes in the pine-barrens of Babylon, Oct. 11, 1907. At left, dry pine-barrens about a mile south of Pinelawn. Pines growing more densely than usual. Oaks mostly *Q. ilicifolia*, four or five feet tall. At right, east edge of swamp of Santapogue Creek, looking south, just above the road from Farmingdale to Babylon. Shows principally *Pinus*, *Acer*, and *Betula*.

of an old railroad which runs eastward from Garden City, Nassau County. *Hudsonia ericoides*, another supposed pine-barren plant, I have seen only on a high gravelly hill in the southwestern part

* Most of the stations cited for it in Jelliffe's Flora of Long Island are on the north side of the island, among the hills.

of the town of Huntington, just north of Babylon. *Corema Conradii* may possibly occur somewhere in this region, for according to Mr. J. H. Redfield* it is associated, wherever it grows, with a good many of the species listed above.

The flora of the swamps is considerably richer than that of an equal area of dry pine-barrens. The single pine-barren swamp examined on October 11 contained the following species, some on its edges, some right in the stream, and some in intermediate positions.

TREES	HERBS
<i>Acer rubrum</i>	<i>Osmunda cinnamomea</i>
<i>Nyssa sylvatica</i>	<i>Dulichium arundinaceum</i>
<i>Pinus rigida</i>	<i>Carex stricta</i>
<i>Betula populifolia</i>	<i>Osmunda spectabilis</i> (<i>O. regalis</i>)
SHRUBS	<i>Sparganium</i> sp.
<i>Clethra alnifolia</i>	<i>Lysimachia terrestris</i>
<i>Alnus rugosa</i>	<i>Eriophorum virginicum</i>
<i>Myrica carolinensis</i>	<i>Dryopteris Thelypteris</i> ?
<i>Ilex glabra</i>	<i>Panicularia canadensis</i>
<i>Chamaedaphne calyculata</i>	<i>Pteridium aquilinum</i>
<i>Azalea viscosa</i>	<i>Aster</i> sp.
<i>Leucothoë racemosa</i>	<i>Eupatorium verbenaeifolium</i> ?
<i>Xolisma ligustrina</i>	<i>Andropogon corymbosus abbrevi-</i>
<i>Rhus Vernix</i>	atus †
<i>Kalmia angustifolia</i>	<i>Viola primulaefolia</i>
<i>Azalea viscosa glauca</i>	<i>Solidago arguta</i> ?
<i>Ilex verticillata</i>	<i>Habenaria ciliaris</i> ?
<i>Cephalanthus occidentalis</i>	<i>Lilium philadelphicum</i>
<i>Viburnum cassinoides</i>	<i>Sphagnum</i> sp.
<i>Spiraea salicifolia</i>	(and a few other mosses)

Chamaecyparis thyoides, which grows in some more or less similar swamps in Nassau County, ‡ and *Polygala lutea*, which is

* Bull. Torrey Club 11 : 97-101. 1884.

† Described in Britton's Manual 70. 1901. Formerly referred to the more southern *A. glomeratus* (Walt.) B.S.P. (*A. macrourus* Michx.).

‡ See Torreya 7 : 198-200. O 1907.

said to have been found in or near this particular swamp, I did not see. *Magnolia glauca* (*M. virginiana*) might have been expected in such a place, but apparently it is not known from the western half of Long Island.

Nearly half the shrubs in both habitats are of the Ericaceae and closely allied families. The Compositae constitute nearly half the herbs noted in the uplands and a considerable proportion of those in the swamps; but more complete lists, including spring and summer flowers which become unrecognizable in the fall, would doubtless show a smaller proportion of this family. Evergreens other than pines are very scarce in the dry pine-barrens and not very numerous in the swamps.

The most interesting features of this pine-barren vegetation are brought out by a study of the geographical distribution of its components. For the sake of brevity the species of both habitats may be combined, since it happens that the geographical affinities of both are much the same.

Not one of the species whose identity is certain is confined to the coastal plain, though *Pieris Mariana*, *Clethra*, *Myrica*, *Ilex glabra*, and *Eupatorium verbenaefolium* are mainly so.* On the other hand, *Arctostaphylos*, *Betula populifolia*, and *Panicularia canadensis* are chiefly confined to the glaciated region. *Azalea viscosa*, *Leucothoë*, *Dulichium*, and *Eriophorum* are widely distributed both in the glaciated region and coastal plain, and also occur more rarely in bogs in the southern Alleghanies.† Nearly all the species are common in New England, especially in the southeastern portion.‡ At least one-third of the dry pine-barren plants are common to

* Nearly all the few endemic coastal plain species known from Long Island seem to be bog plants, confined for some reason not fully understood to the eastern half of the island.

† See *Rhodora* 7: 72-76. 1905. At that time I supposed *Dulichium* to be strictly confined to the glaciated region and coastal plain, but I have since noticed that it has been reported from the mountains of Kentucky by Kearney (*Bull. Torrey Club* 20: 479. 1893) and from Cullman County, Alabama, by Mohr (*Contr. U. S. Nat. Herb.* 6: 396. 1901).

‡ See Hollick, *Bull. N. Y. Bot. Gard.* 2: 381-407. 1902; Blankinship, *Rhodora* 5: 128, 129, 133. 1903. I have found most of them also in Worcester Co., Mass., and some of the most abundant species extend at least as far up as northern New Hampshire, according to Chittenden (*U. S. Forestry Bull.* 55: 69, 99. 1905).

the "jack-pine plains" of Michigan (though those are characterized by a different species of pine), according to Spalding* and Beal, † and many of the swamp plants or their near relatives are reported from the same general regions. ‡

Several of the characteristic dry pine-barren plants have been reported by Dr. Britton § from the mountains near the boundary between New York and New Jersey. Much the same flora, and essentially the same types of vegetation, are characteristic of at least some parts of the pine-barrens of New Jersey, judging from the excellent illustrations and descriptions by Hollick, Pinchot, and Gifford in the report on forests which accompanied the report of the state geologist of New Jersey for 1899. || Farther south about half the species, or in some cases closely related forms, follow the coastal plain all the way to Florida, while a good many others are found in the South only in the mountains, where they grow on sunny slopes or in sandy bogs. Of the last-mentioned category are *Pinus rigida*, *Quercus ilicifolia*, *Q. prinoides*, *Comptonia*, *Populus*, *Gaultheria*, *Chamaedaphne*, *Kalmia angustifolia*, *Spiraea*, *Carex stricta*, *Lysimachia*, and *Lilium*. ¶ The remainder are mostly of pretty wide distribution in temperate eastern North America.

About the time of the Glacial period, when the coastal plain is supposed to have been all under water, all these species must have been confined to the mountains and foothills between Pennsylvania and Alabama. When the glaciated region and coastal plain were again laid bare by the retreating ice and water these plants and their associates were doubtless among the first to take possession of the new territory. Their present rather disjointed

* Am. Nat. 17: 249-259. 1883.

† Mich. Flora 16, 17. 1904.

‡ See Transeau, Bot. Gaz. 36: 403, 404. 1903; 40: 431-446. 1905.

§ Bull. Torrey Club 10: 105. 1883; 11: 126-128. 1884; 14: 187-189. 1887. See also Harshberger, Proc. Acad. Nat. Sci. Phila. 56: 606-609. 1904; Rep. 8th Int. Geog. Cong. 604, 605. 1905.

|| See also Lighthipe, Torreyia 3: 79-81. 1903.

¶ For notes on the occurrence of some of these in the southern mountains see Ashe, Bull. N. C. Geol. Surv. 6: 213, etc. 1898; Small, Torreyia 1: 7, 8. 1901; Ashe & Ayres, Pres. Message So. Appalach. Region 93-109. 1902; Harshberger, Bot. Gaz. 36: 379. 1903.

distribution has probably come about chiefly through the subsequent slow but sure encroachments of climax vegetation, on all the better soils.

COLLEGE POINT, L. I.

A TRIP TO JAMAICA IN SUMMER

BY ELIZABETH G. BRITTON

Starting for Jamaica on the twenty-fourth of August, after ten weeks of hot, dry weather in New York, does not seem to be an ideal way of spending a vacation ; but the voyage there and back on the fine large steamships of the Royal Mail and three weeks in the open air collecting were a welcome and beneficial experience. Wakened at dawn by the rockets signalling for a pilot, it was a beautiful sight to see those glorious Blue Mountains loom dark and mysterious with the comet faintly visible above them, and to watch the change of colors on the water and hills as each familiar land-mark came into view. Since our last visit, the earthquake had laid Kingston in ruins ; the cocoanuts at the end of the Port Royal peninsula stood in twenty feet of water and the wrecked steamships of the Hamburg-American line lay on the beach with their tragic history still unfinished. But as we neared our dock, it was but a step "from the sublime to the ridiculous," for there were those same negro boys diving for pennies, exactly as if nothing had happened. Kingston never was a picturesque city and it compared unfavorably with the capitals of any of the larger West Indian Islands ; but it has now the dignity of sorrow and the hope of renovation. Many of the business streets are still a mass of tangled ruins, for the new shops are being built on vacant lots away from the water front. We found the trolleys and railroads running as usual and comfortable accommodations at the Constant Spring Hotel. We spent the day after our arrival at the Hope Botanical Gardens, where the blossoms of the *Poinciana* sprinkled the ground with red and the humming-birds darted in and out of the arbors of *Thunbergia grandiflora* ; and we left by rail for Williamsfield early the following morning, reaching there in time to drive to Mandeville and